I called Bill 3/2/94:
sampled Jan. 1994
sent to Barry D. (4/15/94)
MCL N SL-1 MCL tetra SL-2
Ba SL-3 MC SL-3
Dec 13 letter-(stpo)

Max w/Chen in Billings

Huntingdon
Consulting Engineers Environmental Scientists

Chen-Northern, Inc.
P.O. Box 2730
Missoula, Montana 59806
(406) 543-3045

December 30, 1993

RECEIVED
JAN 05 1994
MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Ms. Pat Potts
Solid and Hazardous Waste Bureau
Montana Department of Health and Environmental Sciences
P.O. Box 200901
Helena, Montana 59620-0901

RE: Response to Comments: MDHES Letters of November 2 and 15, 1993
Richland County Solid Waste District Landfill, Sidney, Montana

Dear Ms. Potts:

This letter presents our responses to comments contained in your recent letters associated with June 1993 groundwater monitoring at the Richland County Solid Waste District Landfill. The following responses are specific to your letter to the Richland County Commissioners, dated November 2, 1993 and to your letter to myself, dated November 15, 1993. In preparing our responses, we understand that your letter of November 2 was transmitted prior to your review of our June 1993 Groundwater Monitoring report, dated October 1993.

RESPONSES TO YOUR LETTER OF NOVEMBER 2, 1993

¶ #2 -- Inorganic Parameters

Your letter states that extremely elevated to elevated concentrations of inorganic parameters have been observed in samples from the three facility monitoring wells. We agree that concentrations of chloride and nitrates measured in samples from the three monitoring wells are elevated with respect to that found in samples from spring S-5. However, the maximum concentration of chloride ever measured in the well samples (153 milligrams per liter [mg/L]) is well below the U.S. Environmental Protection Agency's (EPA) recommended maximum contaminant level (RMCL) for chloride (250 mg/L). Similarly, the highest concentration of nitrates measured in monitoring well samples is below the 10 mg/L MCL for nitrates.

Several other inorganic parameters measured in June 1993 monitoring well samples which were mentioned in your letter were well below EPA's drinking water standards or near laboratory detection limits:

- The maximum concentration of zinc (0.1 mg/L) was measured in the field duplicate sample from well SL-1. The EPA's RMCL for zinc is 5.0 mg/L.

- The concentration of cobalt measured in the sample from well SL-1 was 0.008 mg/L which is slightly above the practical quantitation limit (PQL) for cobalt as defined in our approved sampling and analysis plan (SAP) for the project (Chen-Northern, June 1993).

- Chromium was mentioned in you letter as being anomalous, but was not detected in any June 1993 monitoring well samples.

- You also mentioned that nickel concentrations were anomalous to overall groundwater quality. Nickel was detected in the sample from well SL-1 at the PQL.

¶ #4 -- Relevant Point of Compliance (RPOC)

We will obtain ownership information for properties adjacent to the landfill during our January 1994 monitoring event and submit this information to the department.

¶ #5 -- Detection of Benzene, Toluene, Ethylbenzene and Xylenes (BTEX)

We have no knowledge pertaining to a recent source of BTEX contamination at the landfill. Although soils can contain naturally occurring organic chemicals including BTEX (Dragun, J., 1988, The Soil Chemistry of Hazardous Materials, The Hazardous Materials Control Research Institute, Silver Spring, Maryland), we have not tested site soils for BTEX. In addition, it would be quite difficult to predict the elapsed time between the alleged disposal of petroleum contaminated soil and the time of sampling without knowledge of the disposal.

We are confident that the minor levels of total BTEX measured in the sample from well SL-1 did not originate from our sampling protocol. Our field personnel followed the decontamination and sampling procedure specified in the approved SAP referenced above. These procedures included purging the well with a new, disposable bailer connected to a decontaminated teflon-coated sampling line. Decontamination procedures for the line included scrubbing with a liquinox-potable water solution, and rinsing with potable water, a nitric acid solution, a methanol solution and deionized water. These procedures are recorded on the groundwater sampling log for well SL-1 contained in Appendix B of our June 1993 Groundwater Monitoring report (Chen-Northern, October 1993).

¶ #6 -- Assessment Monitoring

Please refer to the summary of our December 6, 1993 meeting, dated December 13, 1993.

¶ #7 -- Groundwater Elevation Data

You are now aware that groundwater elevation data are presented in our June 1993 Groundwater Monitoring report.

RESPONSES TO YOUR LETTER OF NOVEMBER 15, 1993

¶ #2 and #3 -- Labeling Error for Well 17-2

We initiated a private well inventory for the area surrounding the landfill in the Spring of 1990. Our methods include reviewing available driller's reports on file with the Montana Bureau of Mines and Geology for an area within a two-mile radius of the landfill. Results of our inventory were presented in our Environmental Evaluation report to our client (Chen-Northern, May 1990) and were incorporated into our October 1991 Hydrogeologic Characterization report on file with your department. Information found pertaining to well 17-1 did not include a well log but did indicate that the well was drilled in about 1957 to a depth of 115 feet. Information obtained for well 17-2 indicated that it was completed at a depth of 1385 feet below ground surface. Locations of wells identified on our Location and Vicinity Map were based on legal descriptions contained on driller's reports. A door-to-door search for wells was not completed in 1990.

In your letter to the Richland County Commissioners, dated May 26, 1993, you requested that well 17-1 be included one-time in a routine landfill sampling event. We scheduled the event for June 1993. As you know from your review of our June 1993 Groundwater Monitoring report, we felt it necessary to verify locations of private wells prior to sampling (Section 2.1, page 3). Our field scientist met with Mr. Cliff Lamphire who resides at the property shown for well 17-1 on our Location and Vicinity Map on June 22, 1993. Mr. Lamphire told him that he didn't have a well for drinking water and obtains his water from his daughter's well (well 17-2). Water is supplied by pipeline to his residence. This information is recorded in our field notes included as Appendix A of our June 1993 Groundwater Monitoring report. Our field scientist decided to sample well 17-2 because it was the next nearest well to the landfill that had not been previously sampled. However, he inadvertently labeled the sample as well 17-1.

We identified this accidental bottle labeling error during our data validation procedures subsequent to transmitting the laboratory reports to you in August 1993. You are aware that we documented that well 17-1 was not accessible for sampling (Section 2.1, June 1993 Groundwater Monitoring report). Although we did not immediately notify you by telephone of the accidental error, we did document the error in two separate locations in the report mentioned above (Appendix B, Groundwater Sampling Logs and Appendix C, Laboratory Analytical Results). Sample identification presented in data, text, figures, and tables in our June 1993 Groundwater Monitoring report are correct.

We apologize that this minor bottle labelling error caused you so many problems. In the future, we will make every effort to minimize all forms of human error in our sampling events at the landfill and we will immediately contact you with any problems. Further, we request you wait until data is validated in accordance with the procedures specified in the approved landfill SAP prior to transmitting data reports to the public.

¶ #4 -- Letter to Mr. Milo Lamphire

In accordance with your request, we have prepared a written explanation of the labeling error for well 17-2 for Mr. Milo Lamphire. We have attached a copy of the letter for your information.

¶ #6 -- June 1993 Groundwater Monitoring Report, Section 1.0, Introduction

We believe the word "ongoing" may be ambiguous to report readers not familiar with the three-year project (e.g., the general public). The report could be considered more complete by explicitly listing each analyte analyzed for in August 1990, August 1991 and February 1993. In accordance with your needs, we will revise this section of the report to include a brief summary of previous groundwater analyses at the site.

¶ #7 -- June 1993 Groundwater Monitoring Report, Section 2.1

At your request, we will incorporate an additional explanation regarding the sample labeling problem in the revised report (refer to Section 2.4).

We do not consider Mr. Milo Lamphire's well an appropriate groundwater sampling location for the following reasons:

- According to a conversation with Mr. Lamphire on April 27, 1992, the well was constructed with a backhoe and consists of several vertically stacked 4.5 feet diameter concrete rings (20 feet deep) with an open bottom.
- No information is available to us regarding a grout seal between the concrete rings and the backhoe pit wall to prevent/minimize surface infiltration along the concrete rings.
- Detailed lithologic information for materials subjacent to the well is not available to us.
- No surface seal was observed at the well in June 1993.
- A two-foot diameter above ground metal culvert with a torch-cut door provides well access, but does not seal the well against entry by small mammals, insects, etc.
- After purging the well prior to sampling, two days were required for the well to recover enough for sampling.
- Water obtained from the well was black and turbid. The well is apparently not used frequently.

¶ #8 -- June 1993 Groundwater Monitoring Report, Figure 2

You have requested we provide groundwater elevation contour lines on the figure to show "possible variations in shallow ground water gradient across the site". These lines were not provided because:

The gradient and direction of groundwater flow at the site was determined from relative groundwater elevations measured in the three monitoring wells using simple geometry. Since three points define a plane, and because only three points (monitoring wells) are currently available to us to define the plane, it is not correct to infer that the dip or slope of the plane (e.g. groundwater gradient) varies between the points (monitoring wells) for a particular monitoring event. Therefore, only one gradient can be determined between the three monitoring wells at the site for each monitoring event. In other words, for a given monitoring event using the three monitoring wells, the gradient has to be assumed to be constant across the site.

With regards to the groundwater flow direction, data presented in each of our reports indicates that the flow direction has not varied to any significant extent during our four water level monitoring events at the site. However, the same groundwater elevation data (please refer to Table 1 in the June 1993 report) do show that the gradient has varied. For example, the gradient measured during June 1993 was 0.004 and the gradient in August 1990 was 0.002.

Our Hydrogeologic Characterization (Chen-Northern, October 1991) report presents the variety of hydraulic conductivity tests we performed at the landfill including slug tests, grain size distribution analyses, permeameter tests and double ring infiltrometer tests. In this report we indicate that an appropriate hydraulic conductivity and porosity for the sand and gravel unit at the landfill would be on the order of 0.01 to 0.002 cm/sec and 0.2, respectively. Based on a groundwater gradient of 0.002, the groundwater velocity in the sand and gravel unit could be between 0.06 and 0.3 feet per day. Similarly, the groundwater velocity for a gradient of 0.004 would be between 0.12 and 0.6 feet per day. As you can see, the principal variable in determining the rate of groundwater flow for each monitoring event is the groundwater gradient. At your request and to fulfill requirements of ARM 16.14.706(4), we will state an estimated groundwater velocity in each monitoring report. To that end, we have revised Section 3.1 of our June 1993 Monitoring Report.

¶ #9, 10 and 11 -- June 1993 Groundwater Monitoring Report, Section 3.3.1

1. Possible reasons/sources for BTEX detected in samples from well SL-1 were discussed during our meeting on December 6. Table 2 has been revised to reflect the toluene detected in the sample from well SL-1.

2. Concentrations of methylene chloride have apparently been increasing in samples from well SL-2. We do not have an explanation for the increase. Methylene chloride, however, has not been detected in samples from other wells.

3. Table 2 of our report shows that cis-1,2-dichloroethene has been measured in samples from well SL-1, but has not been detected in samples from wells SL-2 or SL-3. Because tetrachloroethene and trichloroethene have not been detected in samples

from well SL-1, your theory that these compounds are degradation products of cis-1,2-dichloroethene at the site may be invalid. In addition, our review of cis-1,2-dichloroethene, tetrachloroethene and trichloroethene data presented in Table 2 does not seem to support your theory.

¶ #12 -- June 1993 Groundwater Monitoring Report, Table 2

Table 2 has been revised.

¶ #13 and 14 -- Recommendations

Recommendations presented in your November 15 letter were addressed during our meeting on December 6. Please refer to our December 13 summary of the meeting.

Based on your requested changes to our June 1993 Groundwater Monitoring Report, we have prepared a revised final version of the report. I have enclosed two copies of the revised report for your files. Please feel free to call me at 543-3045 if you have any additional questions.

Kind Regards,

K. Bill Clark

K. Bill Clark
Project Hydrogeologist

Enclosure Revised 1993 Groundwater Monitoring Report (two copies)

Attachment Letter to Mr. Milo Lamphier (one copy)

cc: w/enc, att

Mr. Barry Damschen
Damschen and Associates, Inc.
P.O. Box 4817
Helena, Montana 59604
(one copy)

Richland County Commissioners
P.O. Box 986
Sidney, Montana 59720
(three copies)

Huntingdon
Consulting Engineers Environmental Scientists

Chen-Northern, Inc.
P.O. Box 2730
Missoula, Montana 59806
(406) 543-3045

December 29, 1993

Mr. Milo Lamphier
35 Rock Hill Drive
Billings, Montana 59101

RE: Water Sample Labeling Error for a June 1993 Groundwater Sample
Richland County Solid Waste District Landfill, Sidney, Montana

Dear Mr. Lamphire:

Huntingdon Chen-Northern is involved with environmental assessments and routine groundwater monitoring at the Richland County Landfill. At the request of the Montana Department of Health and Environmental Sciences (MDHES), we were authorized to obtain groundwater samples from private wells located near the landfill in June 1993. One of the wells requested to be sampled was identified from our 1990 review of well driller's records on file with the Montana Bureau of Mines and Geology (MBMG). Based on the legal description contained on the MBMG records, we believed the well was located on Mr. Cliff Lamphire's property near the landfill. We identified this well in 1990 as "well 17-1". Prior to sampling in June 1993, we felt it necessary to field-verify the presence of this well.

A Chen-Northern field scientist met with Mr. Cliff Lamphire who resides at the property we identified for well 17-1 on June 22, 1993. Mr. Lamphire told him that he didn't have a well for drinking water and obtains his water from his daughter's well (Mrs. Williams). We had previously identified this well as well 17-2. Water is supplied by pipeline to Mr. Lamphire's. Our field scientist decided to sample well 17-2 because it was the next nearest well to the landfill that had not been previously sampled. However, he inadvertently labeled the sample as well 17-1.

At the request of the MDHES, we submitted laboratory reports for June 1993 to Ms. Pat Potts during August. The laboratory report mistakenly identified well 17-2 as 17-1. We identified the accidental bottle labeling error during our data validation procedures subsequent to transmitting the laboratory reports to Ms. Potts. We prepared a report of the June 1993 groundwater monitoring at the landfill the correctly identified the sample from well 17-2 as well 17-2. Our June 1993 Groundwater Monitoring report on file with the MDHES documents the sample bottle labeling error in several locations and we consider that sample identification presented in data, text, figures, and tables in the report are accurate.

On behalf of Chen-Northern, please accept my sincere apology for the confusion related to this bottle labelling error. We are committed to make every effort to minimize all forms of human error in our subsequent sampling events at the landfill and we will immediately contact MDHES with any identified problem.

Kind Regards,

K. Bill Clark
Project Manager

cc. Ms. Pat Potts, MDHES
Mr. Barry Damschen, Damschen & Associates
Richland County Commissioners

Huntingdon
Consulting Engineers Environmental Scientists

Chen-Northern, Inc.
1610 B Street
Box 4699
Helena, Montana 59604
(406) 443-5210
Fax: (406) 449-3729

December 13, 1993

RECEIVED
DEC 14 1993
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Ms. Pat Potts
Montana Department of Health
and Environmental Sciences
Solid Waste Program
Cogswell Building
Helena, Montana 59620

RE: Summary of December 6, 1993 Meeting, Richland County Sanitary Landfill

Dear Ms. Potts:

Thank you for taking the time to meet with the Richland County Commissioners, Mr. Barry Damschen, and ourselves last Monday. The meeting was obviously very constructive and informative for all in attendance. Based on discussions that occurred during the meeting, we understand that MDHES is requiring that the following investigative steps be implemented at the Richland County Landfill:

1) Complete a groundwater sampling event at the landfill during early January, 1994. Water samples will be obtained from on-site monitoring wells SL-1, SL-2, and SL-3 and from spring S-5, located immediately south of the landfill property. Water samples will not be collected from any domestic/stock wells.

2) All water samples will be collected in accordance with procedures described in the project Sampling and Analysis Plan, dated June, 1993. The water samples will be analyzed for parameters listed in Table 1 of ARM 16.14.706 and dichlorodifluoromethane.

3) If any Table 1 parameters are not measured in groundwater samples collected during January, 1994 at concentrations that exceed groundwater protection standards, then the next groundwater monitoring event will be completed sometime during the spring of 1994. Water samples collected during this event will again be analyzed for Table 1 parameters.

4) Assuming that we receive laboratory analytical results for the January, 1994 groundwater monitoring event by mid-February, and assuming that any parameters are measured in the water samples at concentrations that exceed groundwater protection standards, the next groundwater monitoring event will be completed within 90 days of receipt of the laboratory results (mid-May).

5) The "mid-May" groundwater monitoring event will consist of collecting groundwater samples from each of the above referenced sampling stations and analyzing the samples for parameters listed in Table 2 of ARM 16.14.706. This will constitute the initiation of "Assessment Monitoring" at the landfill.

5) If Assessment Monitoring is required, and if any Table 2 parameters are measured at concentrations that exceed groundwater protection standards, then an "Assessment of Corrective Actions" will be initiated at the landfill. The first step associated with an assessment of corrective actions may involve installing a minimum of two additional monitoring wells north of the landfill. Any additional monitoring wells will be installed at a distance no greater than 225 feet from the downgradient property boundary of the landfill. The wells will be installed in time to allow for their inclusion in the next groundwater monitoring event (approximately mid-September, 1994). Methods that will be used to drill, construct, and develop additional monitoring wells will be described in a letter and submitted to MDHES for their review and approval before the wells are installed.

6) Further, if an Assessment of Corrective Actions is initiated, the September, 1994 groundwater monitoring event will include analyzing water samples collected from all monitoring wells (including any new wells) and spring S-5 for Table 1 parameters and any Table 2 parameters that were detected in water samples collected during the mid-May monitoring event. ? 708(4)(a)(ii)

7) Additional steps that may be taken if an Assessment of Corrective Actions is initiated may include the development of alternative groundwater protection standards based on "health based risk" and or an evaluation of additional corrective action technologies.

Please notify either of us at your earliest convenience if your understanding of discussions at the recent meeting differ from that described above. We are in the process of preparing contractual documents for Richland County to complete a groundwater monitoring event at the landfill during January, 1994. Therefore, we would appreciate a timely response if you have any concerns related to issues discussed in this letter. Thanks again for meeting with us last Monday.

Kind Regards,

Terry M Conklin for

K. Bill Clark
Project Manager

Patrick Dunlavy
Landfill Program Manager

xc: Richland County Commissioners
Mr. Kelly Logan/Richland County Sanitarian
Mr. Barry Damschen/Damschen and Associates
Mr. Pat Crowley/MDHES
Mr. Jim Wilbur/MDHES

Richland Co. Landfill Meeting - Dec. 6, 1993

Name	Representing	Ph #
Jim Wilburn	DHES-SHWB	444-1430
Pat Crowley	"	"
Dwight Thiessen	Richland Co.	482-1706
Barry Damschen	DEA	449-8627
Gloria Palachick	Richland Co. Commissioner	482-1706
K. Bill Clark	Chem-Northern	543-3045
Paul Sunlaw	CHEM-NORTHERN	443-5210
Warren E. Johnson	Richland Co. Commissioner	482-1706
Kelly Logan	Sanitarian	482-2207
Walt McNutt	Richland Land Fill Board	482-4400
Pat Potts	DHES/SHWB	444-1430

CLOSED
RICHLAND COUNTY LANDFILL - SIDNEY
LICENSE NUMBER 102

HUNTINGDON

JUNE 1993 GROUNDWATER MONITORING

OCTOBER 1993

IS LOCATED IN THE GROUNDWATER
MONITORING REPORTS ARCHIVE,
BOX NUMBER 6

RECEIVED 11/8/1993

CLOSED
RICHLAND COUNTY LANDFILL - SIDNEY
LICENSE NUMBER 102

HUNTINGDON

RESULTS FOR JUNE 1993 GROUNDWATER AND SPRING SAMPLING

AUGUST 1993

IS LOCATED IN THE GROUNDWATER MONITORING REPORTS ARCHIVE, BOX NUMBER 6

RECEIVED 8/23/1993

Huntingdon
Consulting Engineers Environmental Scientists

Chen-Northern, Inc.
1610 B Street
Box 4699
Helena, Montana 59604
(406)443-5210
Fax: (406)449-3729

May 7, 1993

Ms. Pat Potts
Hydrogeologist
Solid and Hazardous Waste Bureau
Montana Department of Health and Environmental Sciences
Cogswell Building
Helena, Montana 59620

RECEIVED
MAY 10 1993
MONTANA DEPARTMENT OF
AND ENVI
SOLID AND
WASTE BUREAU

RE: Groundwater Monitoring Parameter List
Richland County Solid Waste District Landfill
Sidney, Montana Vicinity

Dear Pat:

Pursuant to your request during our recent telephone conversation, I have attached a revised version of the groundwater monitoring parameter list (Table 2) to be included in the Sampling and Analysis Plan (SAP) for the Richland County Sanitary Landfill. Please review the table and contact me if you have any questions or comments.

It is our intention to finalize the Draft SAP for the landfill (dated December, 1992) prior to conducting the next groundwater monitoring event at the landfill. We have tentatively scheduled the monitoring trip for the first or second week of June, 1993. To that end, please consider the attached table and the contents of my letter to you dated March 2, 1993 as the proposed revisions to the Draft SAP. If you have any additional concerns related to the Draft SAP which are not addressed in these documents, please contact me at your earliest convenience.

Kind Regards,

K. Bill Clark
Project Hydrogeologist

Attachment: Groundwater Monitoring Parameter List (one copy)

cc: w/ Att Mr. Barry Damschen
Damschen and Associates, Inc.
P.O. Box 4817
Helena, Montana 59604

TABLE 2
GROUNDWATER MONITORING PARAMETER LIST
RICHLAND COUNTY SANITARY LANDFILL

Parameter	Method[1]	MDL[2] (mg/l)	PQL[3] (mg/l)	Category[4]	State[5]	Federal[6]
Ammonia (as N)	350.1[7]	0.03	0.05	4	x	
Bicarbonate (HCO_3)	310.1[7]	1	1	2	x	
Carbonate (CO_3)	310.1[7]	1	1	2	x	
Calcium	6010	0.4	1	2	x	
Chloride	9250	0.2	1	2	x	
Iron	6010	0.008	0.05	1	x	
Magnesium	6010	0.31	1	2	x	
Manganese	6010	0.003	0.02	1	x	
Nitrate (as N)	353.2[7]	0.005	0.01	4	x	
Potassium	7610	0.18	1.0	2	x	
Sodium	6010	0.8	1.0	2	x	
Sulfate (SO_4)	9036	1.8	5	2	x	
Chemical Oxygen Demand (COD)	410.2[7]	2.5	5	4	x	
Specific Conductivity	9050	5.1	10	0	x	
Total Dissolved Solids	160.1[7]	11	25	2	x	
Total Suspended Solids	160.2[7]	3.5	5	3	x	
pH	9040	--	--	0	x	
Cyanide	9010	0.002	0.005	5	x	
Antimony	7041	0.005	0.01	1		x
Arsenic	7061	0.001	0.005	1	x	x
Beryllium	7091	0.001	0.002	1		x
Barium	6010	0.03	0.10	1	x	x
Cadmium	7131	0.0002	0.0005	1	x	x
Chromium	7191	0.001	0.002	1	x	x
Cobalt	7201	0.004	0.005	1		x
Copper	7211	0.0003	0.001	1		x
Lead	7421	0.001	0.002	1	x	x
Mercury	7470	0.0002	0.0002	1	x	
Nickel	6010	0.02	0.05	1		x
Selenium	7741	0.001	0.005	1	x	x
Silver	7761	0.0001	0.0002	1	x	x
Thallium	7841	0.006	0.01	1		x
Vanadium	7911	0.04	0.05	1		x
Zinc	6010	0.008	0.02	1		x

(1) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, third edition, November 1986, as revised December, 1987.
(2)MDL = "Method Detection Limit" as defined in 40 CFR Part 136.
(3)PQL = "Practical Quantitation Limit" as defined in 40 CFR Part 258.
(4)Parameter Category as listed in Table 3.
(5)State required parameters per ARM 16.14.706, October 18, 1991.
(6)Federally required parameters per 40 CFR 258, Subtitle D, Appendix I, October 9, 1991.
(7)EPA Manual 600/4-79-020 "Methods for Chemical Analysis of Water and Waste.
(8)n = nominal

TABLE 2 (continued)
GROUNDWATER MONITORING PARAMETER LIST
RICHLAND COUNTY SANITARY LANDFILL

Parameter	Method[1]	MDL[2] (µg/l)	PQL[3] (µg/l)	Category[4]	State[5]	Federal[6]
Acetone	8260	6.3	40	6		x
Acrylonitrile	8260	n10[8]	20	6		x
Benzene	8260	0.46	2	6	x	x
Bromochloromethane	8260	0.21	1	6	x	x
Bromodichloromethane	8260	0.16	1	6	x	x
cis-1,3-Dichloropropene	8260	0.26	1	6	x	x
trans-1,3-Dichloropropene	8260	0.23	1	6	x	x
Ethylbenzene	8260	0.15	1	6	x	x
Ethyl Methacrylate	8260	0.54	5	6	x	
Bromoform	8260	0.30	1	6	x	x
Bromomethane	8260	0.47	2	6	x	x
2-Butanone	8260	6.4	50	6		x
Carbon Disulfide	8260	n10[8]	100	6		x
Carbon Tetrachloride	8260	0.37	2	6	x	x
Chlorobenzene	8260	0.22	1	6	x	x
Chlorodibromomethane	8260	0.19	1	6	x	x
Chloroethane	8260	0.26	1	6	x	
2-Chloroethylvinylether	8260	1.53	10	6	x	x
Chloroform	8260	0.20	1	6	x	x
Chloromethane	8260	0.34	1	6	x	x
1,2-Dibromo-3-chloropropane	8260	2.57	15	6		x
Dibromomethane	8260	0.40	2	6	x	x
1,2-Dibromoethane	8260	0.23	1	6		x
trans-1,4-Dichloro-2-butene	8260	0.66	5	6		x
1,2-Dichlorobenzene	8260	0.15	1	6		x
1,4-Dichlorobenzene	8260	0.14	1	6		
Dichlorodifluoromethane	8260	0.22	1	6	x	x
1,1-Dichloroethane	8260	0.21	1	6	x	
cis-1,2-Dichloroethene	8260	0.15	1	6		x
trans-1,2-Dichloroethene	8260	0.26	1	6	x	x
1,2-Dichloroethane	8260	0.30	2	6	x	x
1,2-Dichloropropane	8260	0.20	1	6		x
2-Hexanone	8260	5.20	10	6		x
Iodomethane	8260	1.75	10	6	x	x
Methylene Chloride	8260	1.02	5	6	x	x
4-Methyl-2-pentanone	8260	4.40	10	6		x
1,1-Dichloroethene	8260	0.23	1	6	x	x

TABLE 2 (continued)
GROUNDWATER MONITORING PARAMETER LIST
RICHLAND COUNTY SANITARY LANDFILL

Parameter	Method[1]	MDL[2] (µg/l)	PQL[3] (µg/l)	Category[4]	State[5]	Federal[6]
Styrene	8260	0.19	1	6	x	x
1,1,1,2-Tetrachloroethane	8260	0.21	1	6		x
1,1,2,2-Tetrachloroethane	8260	0.34	1	6	x	x
Tetrachloroethene	8260	0.16	1	6		x
Toluene	8260	0.24	1	6	x	x
1,1,1-Trichloroethane	8260	0.16	1	6	x	x
1,1,2-Trichloroethane	8260	0.69	1	6	x	x
Trichloroethene	8260	0.17	1	6	x	x
Trichlorofluoromethane	8260	0.09	1	6	x	x
1,2,3-Trichloropropane	8260	0.17	1	6	x	x
Vinyl acetate	8260	2.30	10	6	x	x
Vinyl Chloride	8260	0.27	1	6	x	x
Xylene	8260	0.51	1	6	x	x

(1) "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, third edition, November 1986, as revised December, 1987.
(2)MDL = "Method Detection Limit" as defined in 40 CFR Part 136.
(3)PQL = "Practical Quantitation Limit" as defined in 40 CFR Part 258.
(4)Parameter Category as listed in Table 3.
(5)State required parameters per ARM 16.14.706, October 18, 1991.
(6)Federally required parameters per 40 CFR 258, Subtitle D, Appendix I, October 9, 1991.
(7)EPA Manual 600/4-79-020 "Methods for Chemical Analysis of Water and Waste.
(8)n = nominal

CLOSED
RICHLAND COUNTY LANDFILL - SIDNEY
LICENSE NUMBER 102

HUNTINGDON

FEBRUARY 1993 GROUNDWATER SAMPLING RESULTS

APRIL 1993

IS LOCATED IN THE GROUNDWATER MONITORING REPORTS ARCHIVE, BOX NUMBER 6

RECEIVED 4/7/1993

Richland co/sidney II/gradatr

Huntingdon
Consulting Engineers Environmental Scientists

Chen-Northern, Inc.
1610 B Street
Box 4699
Helena, Montana 59604
(406) 443-5210
Fax: (406) 449-3729

March 2, 1993

Ms. Pat Potts
Hydrogeologist
Solid and Hazardous Waste Bureau
Montana Department of Health and Environmental Sciences
Cogswell Building
Helena, Montana 59620

RE: Response to Comments
Draft Sampling and Analysis Plan
Richland County Solid Waste District Landfill
Sidney, Montana Vicinity

RECEIVED
MAR 0 3 1993
MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES
SOLID AND HAZARDOUS WASTE BUREAU

Dear Pat:

We appreciate your prompt and thorough review of our draft sampling and analysis plan (SAP) for the Richland County Sanitary Landfill, dated December, 1992. As you know, we sampled the specific wells and spring listed in your letter to Richland County granting Conditional Approval of our draft SAP during the week of February 9, 1993.

This letter provides responses to the comments presented in your letter to the Richland County Commissioners, dated January 26, 1993. The following responses are offered in the order presented in your letter.

Table 1 - List of Equipment and Materials for Groundwater Sampling

(1) Latex sampling gloves are listed in the revised Table 1.

(2) The beaker listed in Table 1 is used to measure field parameters including temperature, pH and specific conductivity during the purging and sampling procedures. Prior to measuring these parameters for each sample, the beaker is decontaminated. Sample containers for VOC analyses are filled directly from the sampling apparatus (e.g., disposable bailer). Each VOC sample container is preserved by adding approximately 3 to 4 drops of hydrochloric acid (HCL) to lower the pH in the sample to <2 standard units. The amount of HCL added to the samples to achieve this pH is determined empirically in the field during each sampling event. As a further check on the pH of VOC samples, our laboratory verifies pH prior to analysis.

(3) The keys for the keyed-alike locks on the three monitoring wells will be kept in the landfill attendant's trailer/shop. We will also bring spare keys for these locks for each sampling event.

(4) A filter apparatus and filters are included in the revised Table 1.

Section 2.6 -- QA/QC Samples

(5) A trip blank will be included in the sample train for each monitoring event. We state this in Section 2.6 (page 14) of our draft SAP.

(6) In this section of our draft SAP, we presented the proposed type of field QA/QC samples we would include with each sampling event including a trip blank and either a field duplicate or cross-contamination blank. Field duplicates can provide an unbiased measure of laboratory precision and an indication of sample heterogeneity. Cross-contamination blanks can provide a measure of variation associated with field sampling techniques. Based on your comment and our desire to incorporate field QA/QC samples into the sample train at a frequency of one set per 20 samples, we will obtain both a field duplicate and cross-contamination blank during each subsequent monitoring event. Methods to obtain duplicate VOC samples will be identical to those for natural samples as described in response No. 2, above.

(7) Cross-contamination blank samples will be prepared during each sampling event. Please refer to response No. 6, above.

Table 2 - Groundwater Monitoring Parameter List

(8 -- 11) Pursuant to your comments and your discussions with Ms. Kathy Smit of our laboratory, we have revised Table 2. The PQL column has been replaced by a MDL (method detection limit) column.

Laboratory Internal Quality Control Manual

(12) Please refer to the revised Table 2.

Standard Operating Procedures

(13) Our Grundfos® Redi-Flo2 pump is constructed of 316 Stainless Steel, 329 Stainless Steel (splined shaft only) and Teflon®. Our HAPPY HOSE!® discharge tube and cable assembly is constructed of PVC/polyethylene materials. Decontamination procedures for the pump/tube assembly will consist of the following:

- The exterior of the pump and tube are scrubbed with a liquinox/potable water solution to remove any visual contamination. Potable water will be obtained from a known source (e.g., City of Sidney municipal supply).

- The exterior of the pump and tube are then scoured with a high pressure hot water washer using potable water.
- A solution of liquinox and potable water is prepared in a decontaminated 5-gallon container and is then pumped through the pump and discharge tube.
- Subsequent to the soap solution, potable water stored in a decontaminated 5-gallon container is pumped through the pump and discharge tube.
- Deionized water is then pumped through the pump and hose as a final rinse followed by rinsing the exterior of the pump and tube with deionized water.

(14) SOP No. 4 has been included in the SAP.

(15) We will incorporate the following description of the spring sampling sites in Section 2.2 of the SAP.

Spring S-3 is located approximately one mile north of the landfill at an elevation of approximately 2070 feet above mean sea level (Figure 1). The spring appears to discharge from a coal seam at approximately 10 gallons per minute (gpm). A small well defined natural channel conducts the flow northward to a stock pond. The channel is of sufficient depth near the point of spring issuance to fill one-liter sample containers.

The sampling site for spring S-5 is located approximately 800 feet south of the landfill's southern property boundary (Figure 2) at an elevation of approximately 2140 feet above mean sea level. Spring S-5 issues from a northeast-facing hillslope. A galvanized metal pipe buried in the hillslope conveys water from the spring to a stock tank. The discharge from the pipe is approximately one gallon per minute.

We will include the following spring sampling procedure in Section 2.5 of the SAP.

Grab samples of water from spring S-3 will be obtained as near the point of issuance as possible/practicable. Sample containers, facing upstream, will be introduced into the channel and filled directly. Samples of water from spring S-5 will be obtained directly from the stream of water emanating from the end of the discharge pipe.

(16) Decontamination procedures for sampling equipment will not be necessary because the sample containers will be filled directly.

Appendix D - Site Safety and Health Plan

(17) The Range description in Section 1.0 of our Site Safety Plan has been changed to R59E.

General Comment - Well Purge Water

(18) Currently available groundwater chemistry results for project wells (August 7-8, 1991) indicate that the MCL for tetrachloroethylene was exceeded in the sample from well SL-2. Analytical results from other project wells did not exhibit concentrations of any parameter in excess of established MCLs. Water generated during well purging activities is slightly turbid and purge water volumes vary between approximately 6 gallons for well SL-1 and 25 gallons for well SL-3 (February 9 and 10, 1993 data). The unsaturated thickness above the uppermost aquifer at the site ranges between 22 and 73 feet. Based on these site specific data, we contend it is inappropriate to containerize well purge water for disposition at a municipal waste water treatment plant.

We propose to apply (thin-spread/sprinkle) purge water on the ground surface at areas at the facility that have reportedly not been landfilled. We will assure that the purge water infiltrates and does not leave the landfill property. Our proposed land application area is located in the vicinity of the equipment yard near the southwest portion of the facility. However, based on our telephone conversation on February 23, 1993, if "visible/visual" or olfactory indications of contaminants are observed in well purge water, we propose to contain the purge water until analytical results are available. At that time, we will discuss analytical results with you and present disposition alternatives for the purge water.

After reviewing the preceding responses to your comments, please contact me if you have any additional questions. I will submit two copies of the final SAP for your files subsequent to hearing from you.

Kind Regards,

K. Bill Clark
Project Hydrogeologist

cc: Mr. Barry Damschen

Richland Co. gw

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Proof RH DATE: 11/10/93

1. Pat C. RPC
2. Jon D. JD
3. Roger T RCT

☑ Approval	☐ Comment	☐ Necessary Action
☐ Note and Return	☐ Note and File	☐ Investigate
☐ Prepare reply	☐ Signature	☐ See Me
☐ As requested	☐ For your information	☐ Per Conversation

REMARKS:

sw/ richsid.chn

sig p. 3

mailed 11-15-93 BH

FROM: p 3

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Solid Waste Program
MARC RACICOT, GOVERNOR **406/444-1430**
FAX # (406) 444-1499
STATE OF MONTANA
OFFICE LOCATION 836 Front Street Helena, Montana
MAILING ADDRESS: PO BOX 200901 Helena, MT 59620-0901

November 15, 1993

Bill Clark, Project Hydrogeologist
Chen Northern, Inc.
P.O. Box 2730
Missoula, Montana 59806

RE: **SIDNEY CLASS II LANDFILL, RICHLAND COUNTY - LICENSE NO. 102**
JUNE 1993 GROUND WATER SAMPLING EVENT - REVIEW OF THE GROUND WATER MONITORING REPORT

Dear Mr. Clark:

On August 23, 1993 the Montana Department of Health and Environmental Sciences Solid Waste Program (the Department) received a copy of the analytical results from the June 1993 ground water sampling event conducted at the Sidney Class II Landfill. Although your cover letter accompanying these results suggested an upcoming report, the Department had received no such report prior to November 2, 1993 when I felt compelled to respond to the results of the June 1993 sampling event.

On November 8, 1993 the Department did receive the report from Chen Northern reviewing the June 1993 ground water sampling event analytical results. Upon my examination of this report and the analyses contained within, I discovered the well analytical data results originally labeled as 17-1, changed to 17-2 in this report. The text of the report states that 17-1 was not accessible to sample. I was not aware of this mis-labeling of the wells in the original analytical results submitted in August 1993 to the Department. Therefore, I assumed that 17-1 was accessible, and 17-2, which is completed in a much deeper aquifer, was not considered to be a correlative sampling point for this study.

Propagating this mis-information still one step further, I spoke to Milo Lamphire over the phone concerning the results as they had been submitted to me in August 1993. I followed up our conversation with a letter confirming and copying this apparently incorrect well information (i.e. 17-1 results are really 17-2 results, 17-1 was not sampled).

Mention of this labeling error was not discussed in the November report from Chen Northern, other than a in a footnote on a cover letter in Appendix C. I was confused until I spoke with you over the phone on November 9, 1993. I am still extremely disappointed that Chen Nothern noticed this sample labeling error but did not notify me, either by phone or in writing when they discovered it. I found the error from comparing the data presented in the report with the original analytical data submitted to the Department in August 1993. I believe it is Chen Northern's responsibility to state in writing what has happened with the analytical result labeling system for this sampling event, and provide a copy of this explanation to both the Department and to Mr. Milo Lamphire.

Specific comments concerning information presented in the June 1993 Ground Water Monitoring Report at the Richland County Sanitary Landfill in Sidney, Montana are as follows:

1.1 INTRODUCTION (page 1, paragraph 2)
Although ground water monitoring is considered to be "ongoing" at this site according to Chen Northern, sampling frequency at this facility has not met the semi-annual (2 times per year) sampling requirements [see the Administrative Rules of Montana (ARM) 16.14.706(4)] in 1990 or 1991; however, ground water sampling events scheduled in 1993 should fulfill the semi-annual requirement, (assuming the Fall 1993 event is conducted as planned). Please elaborate on the term "ongoing" by listing the previous ground water sampling events by the date conducted and parameters/constituents analyzed for each event.

> Please note that as far as frequency of sampling is concerned, the Department sincerely appreciates the County's efforts to come into ground water monitoring compliance in 1993.

2.1 VERIFICATION OF PRIVATE WELL LOCATIONS (page 3)
This might be an appropriate place in this report to more fully clarify the issue concerning analytical data results labeled 17-2 in the November 1993 report, compared to the original analytical well data labeled 17-1 in the August 1993 data submittal. Do you consider Milo Lamphire's well ("Lamphire") appropriate to collect valid ground water samples representative of the natural quality of the water in the area? Please provide details.

FIGURE 2 (page 7), etc.
Please provide ground water elevation contour lines on Figure 2 "Ground Water Elevation Map". This should show possible variations in shallow ground water gradient across the site. According to ARM 16.14.706(4), the rate and the direction of ground water flow is required to be determined each time a well is sampled. If a valid rate of shallow ground water flow cannot be determined from the existing site information, plans should be made as soon as possible to conduct pump/slug tests to determine the rate of shallow ground water flow. The Department will need to be notified concerning the specifics of such a test(s) prior to implementation.

3.3.1 ORGANIC WATER QUALITY (page 9)

1. Please discuss possible sources for the benzene, toluene, ethylbenzene, and xylenes (BTEX) detected in the June 1993 sampling event in monitoring well SL-1. Note that toluene was also detected in SL-1 at laboratory detection limits, but was not listed as one of the contaminant constituents in this portion of the report.

2. Are you able to provide any suggestions as to the increasing levels of methylene chloride in the ground water at the facility?

3. Cis-1,2-dichloroethene is considered to be a degradation product of both tetrachloroethene and trichloroethene. Could the increasing concentrations of cis-1,2-dichloroethene be a reason for the reduced concentrations of tetrachloroethene and trichloroethene at this site?

TABLE 2 (page 10)

The maximum contaminant level (MCL) for cis-1,2-dichloroethene was given as 5 ug/L on this table. Please provide the source for this information. As of May 1993, the U.S. EPA determined an MCL for cis-1,2-dichloroethene to be 70 ug/L.

RECOMMENDATIONS:

DETERMINE THE EXTENT OF THE PLUME(S) OF CONTAMINANTS

According to ARM 16.14.708(4), if constituents from the Table II/App.II list are detected to be in concentrations statistically significant above Ground Water Protection Standards, the nature and extent of the contaminant plume(s) must be determined by installing additional monitoring wells. Please seriously consider installing at least 2 additional hydraulically down gradient monitoring wells in the shallow water-bearing unit presently being monitored. If sufficient area is not available to install these wells on property owned by the County, arrangements should be made to install these wells off site for the purpose of determination of plume extent. The Department suggests that wells be installed hydraulically down gradient from SL-2 and SL-3, no greater than 225 feet from the existing monitoring wells. Two hundred and twenty-five feet was selected based on one half of the maximum acceptable distance for a Relevant Point of Compliance (RPOC), which is no greater than 450 feet from the edge of the waste management unit boundary. Unfortunately, because this additional 225 feet of property margin is probably <u>not</u> owned by the County, for the purposes of ground water clean-up, the RPOC boundary will be at the edge of the property presently owned by the County.

REDUCE THE SOURCE OF INFILTRATION OF MOISTURE INTO THE SOLID WASTE

Place cover material over the inactive portions of the already landfilled areas that consists of low permeability soils (i.e. compacted clay cover, with permeabilities no higher than 10^{-5} cm/sec.) which should prevent additional infiltration of surface moisture into the ground. Reduced moisture within the solid waste should drastically reduce the volume of leachate generated. This

would also reduce the amount of leachate that could migrate vertically downward into the shallow saturated zone.

The Department realizes that a meeting with all parties involved with the Sidney Class II landfill site might be beneficial at this time. Therefore, I would like to confirm a meeting time of 9:00 A.M., Monday, December 6, 1993 at the Solid Waste Office located at 836 Front Street, in Helena.

I look forward to our meeting. If you have any questions before the scheduled meeting, please give me a call.

Sincerely,

Pat Potts

Pat Potts
Environmental Specialist

cc: Richland County Commissioners, P.O. Box 986, Sidney, MT 59270

Barry Damschen, Damschen & Associates, Inc., P.O. Box 4817, Helena, MT 59604

Kelly Logan, R.S., Richland County Sanitarian, 221 Fifth Street SW, Sidney, MT 59270

Mr. Harold Mercer, Mayor, City of Sidney, 115 2nd Street SE, Sidney, MT 59270

path: sw\richsid.chn
file: richland co/sidney class II/grd wtr (corr)

Richland

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Roof RA DATE: 11/4/93

1. Pat C. PPL
2. Jon D JD
3. Roger T pct

☑ Approval	☐ Comment	☐ Necessary Action
☐ Note and Return	☐ Note and File	☐ Investigate
☐ Prepare reply	☐ Signature	☐ See Me
☐ As requested	☐ For your information	☐ Per Conversation

REMARKS:

sw/milo.let

Laura: mail to (all this stuff) 2

FROM: P3

mailed 11-8-93 DN

Milo Lamphire
35 Rock Hill Dr.
Billings, MT 59101

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Solid Waste Program
MARC RACICOT, GOVERNOR **406/444-1430**
FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION 836 Front Street Helena, Montana
MAILING ADDRESS: PO BOX 200901 Helena, MT 59620-0901

November 8, 1993

Milo Lamphire
35 Rock Hill Drive
Billings, Montana 59101

RE: **SIDNEY CLASS II LANDFILL, RICHLAND COUNTY - LICENSE NO. 102**
REQUEST FOR CLOSURE INFORMATION

Dear Mr. Lamphire:

During our telephone conversation last evening you requested information on the closure status of the Sidney Class II Landfill. At the present time the Richland County Refuse Board has not notified the Department that the landfill will close. Additional monitoring (methane), record keeping, an up-dated operations and maintenance plan, and a current closure plan will be required on April 9, 1994, if the landfill does not close by the April 9, 1994, the U.S. EPA extended deadline.

Richland County has submitted an application to the Department for a new landfill location. The Department has reviewed and commented on this application, but has not received any responses to our comments/questions. Therefore, the County cannot proceed until the Department has reviewed and approves the requested responses, issues an Environmental Assessment, and holds a 30 day public comment period.

To receive any data on this site, as well as possible closure information on the existing Sidney Class II Landfill, the Department suggests you contact the Richland County Commissioners for this information as it becomes available. Submittal of a closure plan for the Sidney Class II Landfill is anticipated before the first of the year. If you do not find this acceptable, the Department can add your name to copies of correspondence sent out by the Department.

Per your request, enclosed is a copy of the most recent ground water/surface water analytical data available from the site. This sampling event includes many of the surrounding local supply wells, of which your well (Lamphire) is one. I have also enclosed a copy of my most recent letter to the

commissioners, attempting to explain the site-specific highlights of the new regulations. Note that the analytical data you requested is quite extensive.

If you plan on requesting any additional data from the Department, bear in mind that the Department will be required to charge you for xeroxing copies based on the quantity of copies involved. The Department files are open to the public, and you may come to our office anytime during regular working hours and review the data in our files. As suggested above, the County should have all site documents on file for public review, as well.

In discussing the results of ground water quality analysis of your well with you over the phone, I would like to reiterate in writing that the condition of this well at the surface has been reported to be questionable for sampling. Based on this site information, any further sampling of this well may incur non-representative constituents in the analytical results, due to the poor (possibly, non-existent) seal at the surface. Also be aware, that the ground water analysis required by the Department does not include all necessary parameters to determine potability. We strongly encourage you to have the local Health Department sample this well before it is used as a domestic water supply. We also encourage you to have a water well driller inspect this well completion, as no data is available on the well and the construction is questionable, especially the existing surface conditions around the well.

If I can be of any additional assistance, or you have any questions, please give me a call.

Sincerely,

Pat Potts

Pat Potts
Environmental Specialist

enclosures

cc: Bill Clark, Project Hydrogeologist, Chen-Northern, Inc., 1610 B Street, Box 4699, Helena, MT 59604

Barry Damschen, Damschen & Associates, Inc.,P.O. Box 4817, Helena, MT 59604

path: sw\milo.let
file: Richland County/Sidney Class II Landfill/ground water (corr)

Richland Co

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Roof @ U DATE: 11/1/93

1. Pat C
2. Jon D JD
3. Roger T pc

- [x] Approval
- [ ] Comment
- [ ] Necessary Action
- [ ] Note and Return
- [ ] Note and File
- [ ] Investigate
- [ ] Prepare reply
- [ ] Signature
- [ ] See Me
- [ ] As requested
- [ ] For your information
- [ ] Per Conversation

REMARKS:
sa/richsid.593

FROM: P3

mailed 11-3-93 EN

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Solid Waste Program
MARC RACICOT, GOVERNOR **406/444-1430** FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION 836 Front Street Helena, Montana
MAILING ADDRESS: PO BOX 200901 Helena, MT 59620-0901

November 2, 1993

Richland County Commissioners
P.O. Box 986
Sidney, Montana 59270

RE: **SIDNEY CLASS II LANDFILL, RICHLAND COUNTY REFUSE DISTRICT - LICENSE NO. 102**
GROUND WATER MONITORING - REVIEW OF ANALYTICAL DATA AND NEW REGULATIONS

Dear Commissioners:

In reviewing the analytical data results over the past several years at the Sidney Class II Landfill facility, it is apparent that the natural quality of the ground water has been impacted at the site. Constituents found in the ground water which are most generally associated with landfilling activities are the volatile organic compounds (VOCs). The site-specific VOCs that have been repeatedly detected in the ground water analytical results from the monitoring wells installed in the shallow locally extensive water-bearing unit underlying the site are: tetrachloroethene, dichlorodifluoromethane, cis-1,2-dichloroethene, chloroform, and methylene chloride.

Inorganic parameters that have been observed to have extremely elevated concentrations in the facility monitoring wells are: chlorides, nitrates, and the chemical oxygen demand (COD). Elevated metal concentrations have been detected for barium, manganese, and zinc. Somewhat anomalous metals to the overall ground water quality, such as cobalt, chromium, and nickel were detected in several of the monitoring wells.

Ground Water Protection Standards (GWPS) must be determined for the above VOCs, as well as any other parameters/constituents required to be sampled in the ground water at this site [Administrative Rules of Montana (ARM) 16.14.708(5)]. A GWPS for each parameter/constituent must be established based on 1 of the following 3 criteria:

(a) **Maximum Contaminant Levels (MCL)** which have been approved by the U.S. EPA and are incorporated into the ARM Title 16, Chapter 20, Subchapter 2 as Montana Ground Water Quality Standards, or

(b) and (c) If no MCL has been approved for a particular listed parameter/constituent, **background** well(s) concentration must be used to determine if a statistically significant increase (SSI) in any constituent concentration has occurred in the down gradient wells, when compared to the background well concentrations, or

(d) An **Alternative Ground Water Protection Standard (AGWPS)** may be approved by the Department for those constituents that do not have an approved MCL. AGWPSs are established in accordance with EPA guidelines for assessing the health risks of environmental pollutants [see (i) through (iv) of this section for additional references].

GWPSs must not be exceeded beyond the **Relevant Point of Compliance (RPOC)**, which is no greater than 150 meters from the waste management unit boundary, on land owned by the owner of the disposal facility [see, ARM 16.14.708(1)(e)]. To determine the RPOC at the Sidney Class II Landfill, a property ownership map including the waste management unit boundaries of the landfill **is required by the Department**. Using this map the proposed RPOC should be outlined as defined above. Where the ownership boundary and the waste management unit boundary may be synonymous, or nearly so, the RPOC could be very near the edge of the waste. This situation would allow for literally no margin for contaminated ground water (i.e., the plume) to exist any distance away from the waste boundary itself.

The Department is extremely concerned over the concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) detected in the ground water samples collected at monitoring well SL-1. These constituents have not been detected at this facility in the past. With 11 ppb of benzene detected, one would assume that very little time or distance from the source of contaminant deposition has transpired limiting volatilization of the light-end hydrocarbons (such as benzene), and causing contamination to migrate into the ground water. One of 2 more obvious scenarios may have taken place at this site to cause BTEX to be detected in the ground water at SL-1:

(1) A load of petroleum contaminated soil (from an underground storage tank leak, or a spill) was taken at the facility prior to the date the well was sampled, or

(2) Monitoring well SL-1 appears to have been the first monitoring well sampled at this site (12:00 on the chain-of-custody form). It could be possible that the pump and/or the sampling equipment had been poorly decontaminated from the previous site (possibly an UST job), and inadvertently introduced anomalous contaminants into the first ground water monitoring well samples collected at this site.

A statistically significant increase over a GWPS at the RPOC will initiate **Assessment Monitoring**. According to ARM 16.14.708(1)(i), the owner operator has 90 days to demonstrate that a source other than a disposal unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground water. If such a demonstration is not made or is considered to be unsuccessful by the Department, **Assessment Monitoring** must be initiated within the 90-day timeframe.

No ground water level data was submitted to the Department with the June 1993 analytical results. The direction of ground water flow and the rate of ground water flow must be determined each time a well is sampled [see, ARM 16.14.706(4)(a)].

With the promulgation of the revised ground water monitoring rules which were effective on October 9, 1993, solid waste disposal facilities will no longer be allowed to contaminate the ground water outside the RPOC. The Sidney Class II Landfill has repeatedly seen contamination levels well over MCLs in the ground water being monitored beneath the facility. The Department would like to encourage Sidney/Richland County and their technical representative(s) to meet with the Department as soon as possible.

If more appropriate monitoring well locations need to be installed closer to the RPOC (as outlined on the above-requested map of the facility and property ownership) to provide a better characterization of the extent and the concentrations of the contaminants that are being detected in the ground water; efforts should be made prior to the required Fall 1993 semi-annual sampling event to install these additional wells. Additional monitoring wells might better delineate the extent of the plume(s), but may not necessary be free of ground water contamination. However, if you continue with only the existing monitoring wells, you will most assuredly be required to initiate **Assessment Monitoring**. This will require the installation of additional wells, as well as increased sampling frequencies. Assessment monitoring will also require sampling of all the wells within 90 days for the Table II list of constituents.

Please contact me as soon as possible if you would like to arrange an appropriate meeting time and place. If you have any questions, please give me a call.

Sincerely,

Pat Potts

Pat Potts
Environmental Specialist

cc: Bill Clark, Project Hydrogeologist, Chen-Northern, Inc., 1610 B Street, Box 4699, Helena, MT 59604

Barry Damschen, Damschen and Associates, Inc., P.O. Box 4817, Helena, MT 59604

Kelly Logan, R.S., Richland County Sanitarian, 221 Fifth Street SW, Sidney, MT 59270

Mr. Harold Mercer, Mayor, City of Sidney, 115 2nd Street SE, Sidney, MT 59270

John Arrigo, Water Quality Bureau

enclosure: Administrative Rules of Montana (Ground Water Monitoring)
path: sw\richsid.s93
file: richland co/sidney class II/grd wtr (corr)

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Proofpt DATE: 5/18/93

1. Pat C PC
2. Jon D JD
3. Roger / Duane ref DLC

☑ Approval	☐ Comment	☐ Necessary Action
☐ Note and Return	☐ Note and File	☐ Investigate
☐ Prepare reply	☐ Signature	☐ See Me
☐ As requested	☐ For your information	☐ Per Conversation

REMARKS:

sw/sidney.sam

FROM: P 3

mailed 5-26-93 lm

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Solid Waste Program
(406) 444-1430
MARC RACICOT, GOVERNOR
FAX # (406) 444-1499
STATE OF MONTANA
OFFICE LOCATION 836 Front Street Helena, Montana
MAILING ADDRESS: PO BOX 200901 Helena, MT 59620-0901

May 26, 1993

Richland County Commissioners
P.O. Box 986
Sidney, Montana 59270

RE: **SIDNEY CLASS II LANDFILL, RICHLAND COUNTY REFUSE DISTRICT - LICENSE NO. 102**
REVIEW OF GROUND WATER ANALYTICAL DATA FROM FEBRUARY, 1993
RECOMMENDATIONS FOR THE SPRING GROUND WATER SAMPLING EVENT

Dear Sirs:

Based on the review of the ground water analytical data submitted from the February, 1993 sampling event and the prior data from the sampling event conducted in August, 1991 at the Sidney Class II Landfill, it appears that the natural quality of at least, the shallow ground water has been impacted by the landfilling operations at this site. Exceedences over the maximum contaminant levels (MCLs) for tetrachloroethene (PCE) have been measured in monitoring well SL-2 during both sampling events.

Other volatile organic compounds (VOCs) detected in the ground water from the most recent sampling event (i.e. February, 1993) are: 1,1,1- trichloroethane, cis-1,2-dichloroethene, dichlorodifluoromethane, 1,1-dichloroethane, methylene chloride, and chloroform. Concentrations of both 1,1,-dichloroethane and cis-1,2-dichloroethene have increased since the August, 1991 sampling event from below practical quantitation limits, to detectable measurable values from the February, 1993 sampling event.

Nitrate concentrations measured in the February, 1993 sampling event in SL-2 and SL-3 were equal to or greater than 9 ppm, respectively. The MCL for nitrate is 10 ppm.

In conjunction with the spring ground water sampling event the Montana Department of Health and Environmental Sciences Solid

Waste Program (the Department) suggests, as mentioned in a letter to the Richland County Commissioners dated September 30, 1992, that the following locations be included as a one-time addition to the scheduled spring sampling event, which normally includes 3 ground water monitoring wells (SL-1, SL-2, SL-3), the spring to the south (S-5), and domestic/supply well 8-1:

* Private wells 8-2, 8-3, 8-4, 17-1 and 7-1; and
* The spring to the north of the site (S-3).

It is my understanding Milo Lamphire, or his father Clifford has a well on what has, in the past been used as a rental property. The Lamphire well is a shallow well that has not been properly installed and has not been maintained. Is this well location equivalent to 17-1? If the well is accessible, a sample should be collected and analyzed for VOCs. VOC information from this location could be helpful in further delineating the extent of the contaminant plume(s). Prior to sampling this well please call Clifford Lamphire at 798-7738 to get permission to enter the property and sample the well.

All other wells sampled should be analyzed for the list of parameters and chemical constituents provided in Table 2 of the attachment to the letter from Chen-Northern dated May 7, 1993, according to procedures described in the Sampling and Analysis Plan.

Water level elevations should be recorded during this expanded spring event at <u>all</u> sampling locations where measurement of the depth to water is possible. This information may help to determine a more accurate direction of shallow ground water flow.

From the analytical results acquired with the areally-expanded spring sampling event, the extent of the contaminant plume(s) may be able to be determined more accurately. Based on this, and any pertinent prior water quality information in the area, a proposal for additional ground water monitoring well installations confirming the present lateral and vertical extent of the plume(s) will be necessary.

Also, based on the information acquired from the above investigations it may be necessary to do further assessment of the ground water contamination and provide a Ground Water Corrective Action Plan.

Scheduled sampling for the first or second week in June, 1993 for the areally-expanded event should coincide with a relatively high seasonal water level.

Sincerely,

Pat Potts

Pat Potts
Environmental Specialist

cc: Bill Clark, Project Hydrogeologist, Chen-Northern, Inc., 1610 B Street, Box 4699, Helena, MT 59604

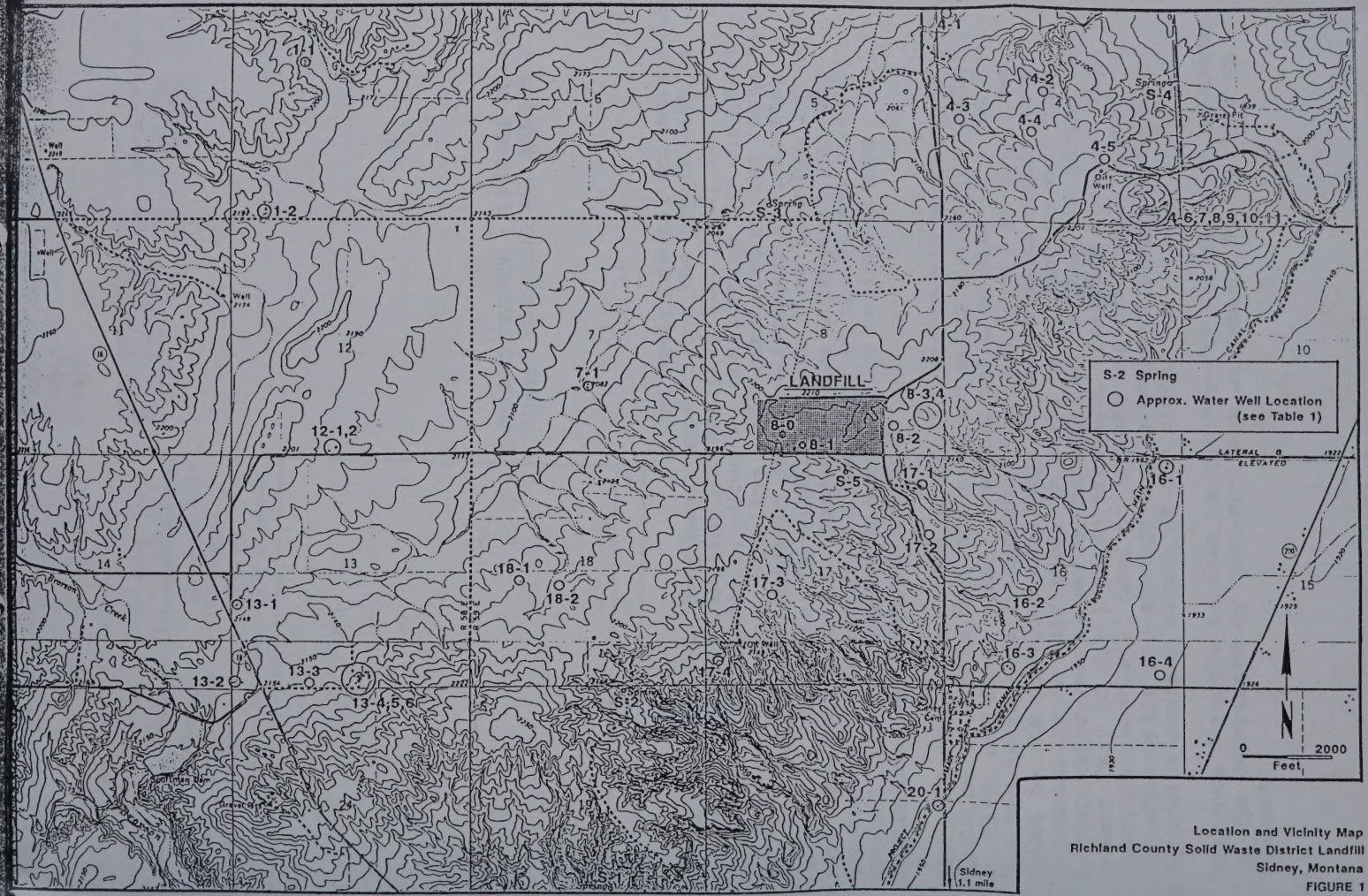
Barry Damschen, Damschen and Associates, Inc., P.O. Box 4817, Helena, MT 59604

Kelly Logan R.S., Richland County Sanitarian, 221 Fifth Street SW, Sidney, MT 59270

Mr. Harold Mercer, Mayor, City of Sidney, 115 2nd Street, S.E., Sidney, MT 59270

John Arrigo, Water Quality Bureau

path: sw\sidney.sam
file: richland co\sidney (old)\grd wtr



Location and Vicinity Map
Richland County Solid Waste District Landfill
Sidney, Montana
FIGURE 1

ROUTE SLIP

DEPARTMENT OF HEALTH & ENVIRONMENTAL SCIENCES

TO: Proof LH DATE: 1/22/93

1. Pat C PJC

2. Jon D JD

3. Roger / Duane pat DWR

☑ Approval	☐ Comment	☐ Necessary Action
☐ Note and Return	☐ Note and File	☐ Investigate
☐ Prepare reply	☐ Signature	☐ See Me
☐ As requested	☐ For your information	☐ Per Conversation

REMARKS:

sw / sidney . sap

FROM: p3

DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Solid and Hazardous Waste Bureau
Solid Waste Program
(406) 444-1430
STAN STEPHENS, GOVERNOR
FAX #(406) 444-1499
STATE OF MONTANA
OFFICE LOCATION: 836 Front Street Helena, Montana
MAILING ADDRESS: Cogswell Building Helena, MT 59620

January 26, 1993

Richland County Commissioners
P.O. Box 986
Sidney, Montana 59270

RE: **SIDNEY CLASS II LANDFILL, RICHLAND COUNTY - LICENSE NO.102**
CONDITIONAL APPROVAL OF THE "DRAFT SAMPLING AND ANALYSIS PLAN".

Dear Commissioners:

The Montana Department of Health and Environmental Sciences Solid Waste Program (the Department) appreciates the opportunity to review the "draft" Sampling and Analysis Plan (SAP) for the Sidney Class II Landfill. However, considering the analytical results from the last sampling event conducted at the facility in August, 1991 which indicated degraded/impacted ground water quality at this site, re-sampling should have been handled in a more expedient fashion. Therefore, the Department strongly recommends that ground water sampling at the Sidney Class II Landfill should commence promptly after reviewing this conditional SAP approval letter.

The only deviation to the original Department's sampling proposal would be to sample only the 3 ground water monitoring wells (SL-1, Sl-2, and SL-3), the 2 domestic wells on site (8-0 and 8-1), and the hydraulically upgradient spring (S-5), at this time. Based on the previous knowledge of the seasonal ground water fluctuations in this area, it would be prudent to wait until higher water levels may be experienced in the late spring/early summer (May to July) to do extensive area-wide testing. This sampling event will need to include the originally listed domestic wells and springs on the adjacent properties, to determine maximum extent of the plume.

Comments directly related to the "draft" SAP document submitted to the Department by Chen-Northern on January 7, 1993 are as follows:

Table 1 - "List of Equipment and Materials for Ground Water Sampling...".

1) Consider including latex or vinyl sampling gloves to this table.
2) If the "beaker" is used for pH determination for volatile organic compound (VOC) sample preservation, this will not be acceptable. Voatiles may be aerated in the container transfer procedures, and there is an increased risk of cross contamination by allowing an additional piece of equipment to be in contact with the sample.
3) Precisely, where are the keys to the monitoring wells located for this site?
4) A filtering apparatus and filters will be needed for dissolved metals analysis.

2.6 QA/QC Samples.

5) One trip blank will be required at this site for each sampling event.
6) One duplicate **set** of samples should be collected from one of the monitoring wells selected at random for each sampling event. As for splitting the first set of samples collected at the well chosen for duplicate sampling, VOC samples may not be split as possible volatilization may occur during the splitting procedure.
7) A cross contamination/equipment blank will be necessary if a non-dedicated pump is used in the monitoring wells, and if the equipment, compositing container, etc. involved in sampling the springs at these locations are not disposable.

Table 2 - "Ground Water Monitoring Parameter List...".

8) Please provide the units for the PQL column.
9) The suggested method numbers for the analysis of lead are: 6010, 7420, and 7421. Explain why Chen selected 7021.
10) The PQLs listed for the following analytical parameters are higher than those provided in 40 CFR part 258 Appendix II. Please explain why Chen's PQLs are so much higher.

Parameter	Chen (units?)	App II
vanadium	0.2	80 ppb
ethyl methacrylate	400	10 ppb
bromoform	10	5 ppb

11) Alternative method numbers that have been accepted by the Department have been based on "Methods for Chemical Analysis of Water and Wastes", EPA 600, 1983. These method numbers do not correspond to those presented in Table 2 for the following parameters:

Parameter	Chen	EPA 600
Ammonia (as N)	417G	350.1
Bicarbonate	403	310.1
Carbonate	403	310.1
COD	508A	410.1, 410.4
TDS	209B	160.1
TSS	209C	160.2

Is there any equivalency in methodology between the EPA 600/4-7-020 "Methods for Chemical Analysis of Water and Wastes" and "Standard Methods for Water and Wastes"? Are these ASTM Methods?

"Laboratory Internal Quality Control Manual".

12) Please explain why the lab QA/QC methods are EPA 600/4-7-020 "Methods for Chemical Analysis of Water and Wastes" method numbers when you refer to SW-846 and "Standard Methods..." in Table 2.

Example: Alkalinity QA/QC Method 310.1 and 310.2
Compared to "Table 2": Bicarbonate and carbonate 403

Example: Arsenic QA/QC Method 206.3 and 206.2
Compared to "Table 2": Arsenic 7061

Example: Chloride QA/QC Method 325.2 and 325.3
Compared to "Table 2": Chloride 9252

Standard Operating Procedures (SOP).

SOP #11, in relation to text Page 12.

13) Please provide specific decontamination procedures for the Rediflo pump and hose. Is the Rediflo pump made of stainless steel?

SOP #04.

14) This SOP has been omitted, but apparently pertains to filtration of the samples. Please include the SOP for sample filtration, as filtration of the samples to be analyzed for metals will be required.

SOP #18 and/or SOP #03.

15) Neither of the above SOPs specifically address sampling from a spring. It would be particularly helpful to describe the spring sites to be sampled and a site-specific recommendation as to sampling procedure. Is there a spring box? Are samples collected from this box, or is there a casing in the ground from which to sample?

Parameter	CHAN	EPA 600
Ammonia (as N)	417G	350.1
Bicarbonate	403	310.1
Carbonate	403	310.1
COD	508A	410.1, 410.4
TDS	209B	160.1
TSS	209C	160.2

Is there any equivalency in methodology between the EPA 600/4-79-020 "Methods for Chemical Analysis of Water and Wastes" and "Standard Methods for Water and Wastes"? Are these ASTM Methods?

"Laboratory Internal Quality Control Manual".

12) Please explain why the lab QA/QC methods are EPA 600/4-79-020 "Methods for Chemical Analysis of Water and Wastes" method numbers when you refer to SW-846 and "Standard Methods..." in Table 2.

Example: Alkalinity QA/QC Method 310.1 and 310.2
Compared to "Table 2": Bicarbonate and carbonate 403

Example: Arsenic QA/QC Method 206.3 and 206.2
Compared to "Table 2": Arsenic 7061

Example: Chloride QA/QC Method 325.3 and 325.2
Compared to "Table 2": Chloride 9252

Standard Operating Procedures (SOP).

SOP #11, in relation to text Page 12.

13) Please provide specific decontamination procedures for the Redi-flo pump and hose. Is the Redi-flo pump made of stainless steel?

SOP #04.

14) This SOP has been omitted, but apparently pertains to filtration of the samples. Please include the SOP for sample filtration, as filtration of the samples to be analyzed for metals will be required.

SOP #18 and/or SOP #03.

15) Neither of the above SOPs specifically address sampling from a spring. It would be particularly helpful to describe the spring sites to be sampled and a site-specific recommendation as to sampling procedure. Is there a spring box? Are samples collected from this box, or is there a casing in the ground from which to sample?

16) Decontamination procedures for equipment used to sample these springs, such as a sampler and the "compositing container" should also be included in this SAP/SOP.

Appendix D - Site Safety and Health Plan.

17) **1.0** GENERAL
Please correct the Range description for the "Site Location" to R59**E.**

General Comment.

18) Based on the prior knowledge of ground water analytical results at this facility, purge water from the downgradient wells may be contaminated with chemical constituents over the established Maximum Contaminant Levels (MCLs). This water should not be discharged to the ground surface before analytical results of the quality of the ground water are available on each well. Plans should be made to containerize this purge water. If contaminant levels are below MCLs, the water may be released to the ground surface in an area of the facility not already used for waste disposal. However, if the ground water analytical results determine that there are chemical constituents in the ground water over MCLs, this water should be disposed of at a local POTW.

These comments should be addressed in writing to the Department in a timely manner. However, ground water sampling should not be delayed pending the finalization of the responses to the above comments or the finalization of the SAP document itself.

I have spoken with Kathy Smit at the Chen lab concerning some of the chemical/methodology-type questions listed above, concerning another facility. I understand she is working on a revised Table 2 "Ground Water Monitoring Parameter List..." to address several of the issues I raised. I would like to be able to standardize the methodology as much as possible for each facility.

If you have any questions, please give me a call.

Sincerely,

Pat Potts

Pat Potts
Environmental Specialist

sw\sidney.sap

cc: Mr. Harold Mercer, Mayor; City of Sidney, 115 2nd Street S.E., Sidney, MT 59270

Kelly Logan R.S., Richland County Sanitarian, 221 Fifth Street S.W., Sidney, MT 59270

Mr. K. Bill Clark, Project Hydrogeologist; Chen-Northern, Inc. 1610 B Street, Box 4699, Helena, MT 59604

Mr. Barry Damschen, Damschen and Associates, Inc., P.O. Box 4817, Helena, MT 59604

Mr. John Arrigo, Water Quality Bureau